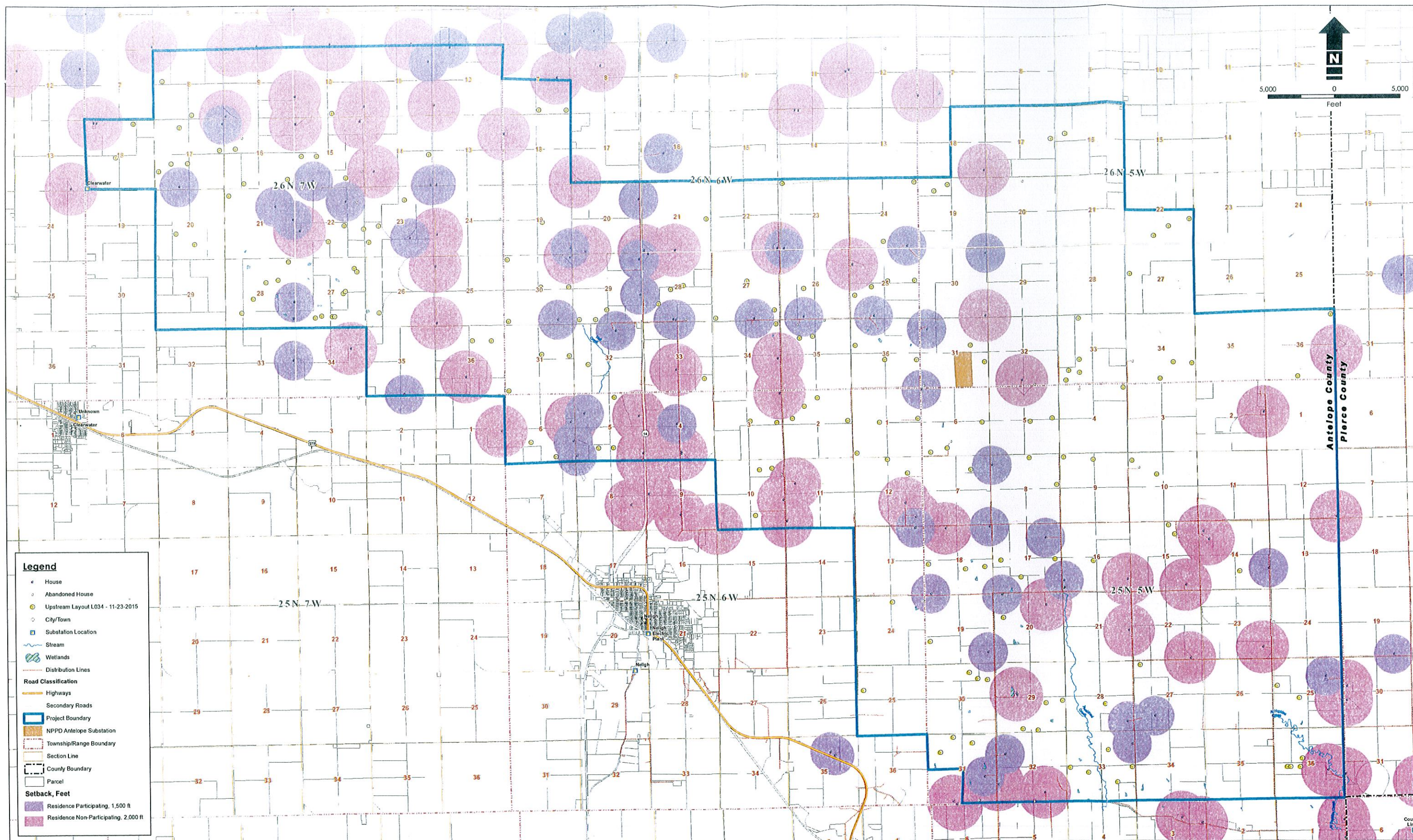


**EXHIBIT F**  
**WETLAND LOCATION MAP AND HOME LOCATION MAP**

*Please see the following document*

F - Wetland &  
Home map





## Exhibit F - Home Location Map

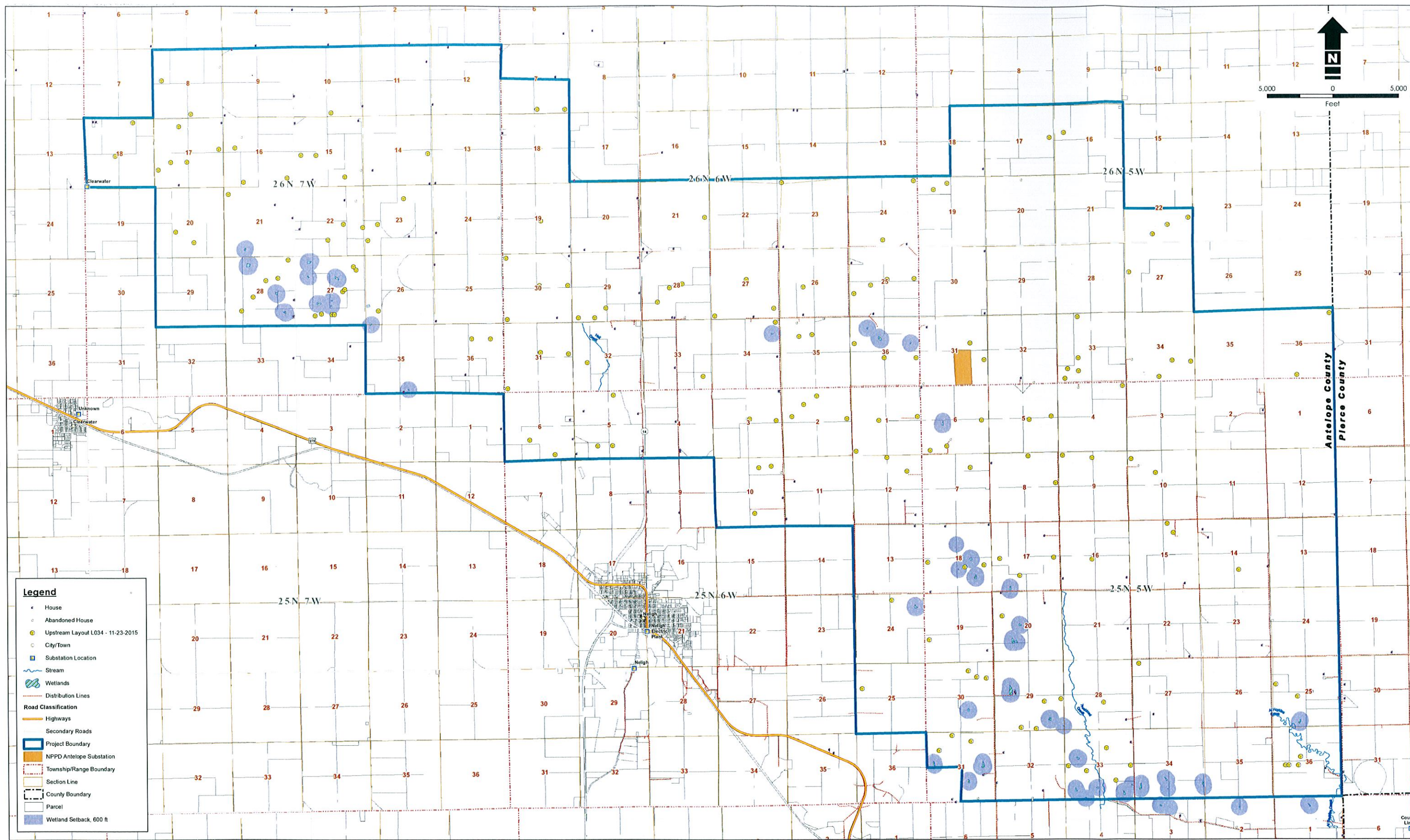
Upstream Wind Energy Project, Antelope-Pierce-Madison Counties, Nebraska

Rev. 04  
December 17, 2015

**Invenergy**

One South Wacker Drive Suite 1900  
Chicago, Illinois 60606  
(312) 224-1400





# Exhibit F - Wetland Location Map

Upstream Wind Energy Project, Antelope-Pierce-Madison Counties, Nebraska

Rev. 04  
December 17, 2015

**Invenergy**  
One South Wacker Drive Suite 1900  
Chicago, Illinois 60606  
(312) 224-1400

**EXHIBIT G  
NOISE ANALYSIS CERTIFICATION**

*Please see the following document*



November 3, 2015

Antelope County Zoning Office  
Charlayne Carpenter - Zoning Administrator  
501 M. Street, Rm. 8  
Neligh, Nebraska 68756

Re: Upstream Wind Energy Project - Noise Analysis and Assessment

Dear Ms. Carpenter,

Invenenergy has requested that Hankard Environmental analyze and assess the noise that would result from the proposed Upstream Wind Energy Project that is to be located in Antelope County, Nebraska. Hankard Environmental has been conducting environmental noise studies across the U.S. and internationally for industrial projects for more than 20 years. We have extensive expertise with noise from utility scale wind turbine farms, including measurements, modeling, and compliance assessments under a variety of noise regulations, as well as expert testimony.

We understand that Antelope County has specific regulations concerning noise emissions from utility scale wind turbine farms as defined by *Zoning Regulations of Antelope County Nebraska, Article 15 Antelope County Wind Tower Regulations (July 2012)*. More specifically, Section 1504.06 *Safety and Design Standards* states "No Commercial/Utility WECS shall exceed 50 dBA at the nearest existing inhabited dwelling. Exception: a Commercial/Utility may exceed 50 dBA during periods of severe weather as defined by the US Weather Service or during shut down or restart for normal maintenance".

During the upcoming permitting process for the proposed project Hankard Environmental will mathematically model noise from the turbines at each of the occupied dwellings located within the project study area. The modeling will employ noise emission levels provided by the turbine manufacturer per IEC 61400-11 and estimate propagation using ISO 9613-2. We will work collaboratively with the project team to ensure that noise levels from the proposed project, as modeled using current professional methods, do not exceed the noise limits imposed by Antelope County.

Please call if you have any questions.

Sincerely,



Michael Hankard  
Principal Acoustical Consultant

EXHIBIT H  
COMSEARCH AND NATIONAL TELECOMMUNICATIONS AND  
INFORMATION ADMINISTRATION REPORTS

*Please see the following document*

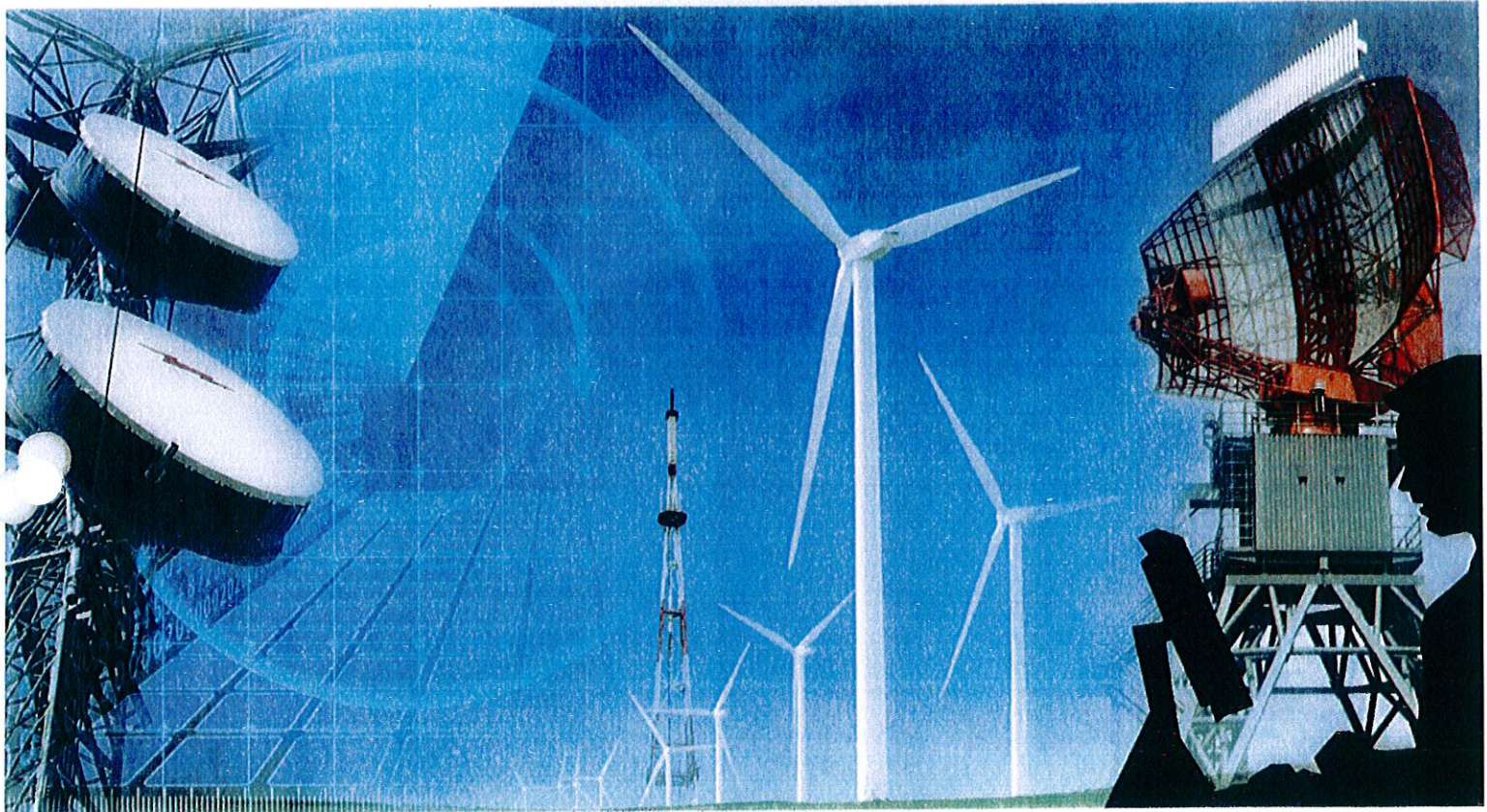
H-microwave  
study



# Wind Power GeoPlanner™

## Microwave Study

### Upstream Wind Farm



Prepared on Behalf of  
Upstream Wind Energy  
LLC

August 10, 2015



COMSEARCH

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## 1. Introduction

Microwave bands that may be affected by the installation of wind turbine facilities operate over a wide frequency range (900 MHz – 23 GHz). Comsearch has developed and maintains comprehensive technical databases containing information on licensed microwave networks throughout the United States. These systems are the telecommunication backbone of the country, providing long-distance and local telephone service, backhaul for cellular and personal communication service, data interconnects for mainframe computers and the Internet, network controls for utilities and railroads, and various video services. This report focuses on the potential impact of wind turbines on licensed, proposed and applied non-federal government microwave systems.

## 2. Project Overview

### Project Information

**Name:** Upstream Wind Farm

**County:** Antelope, Pierce and Madison

**State:** Nebraska

**Number of Turbines:** TBD

**Blade Diameter:** 116 meters

**Hub Height:** 80 meters

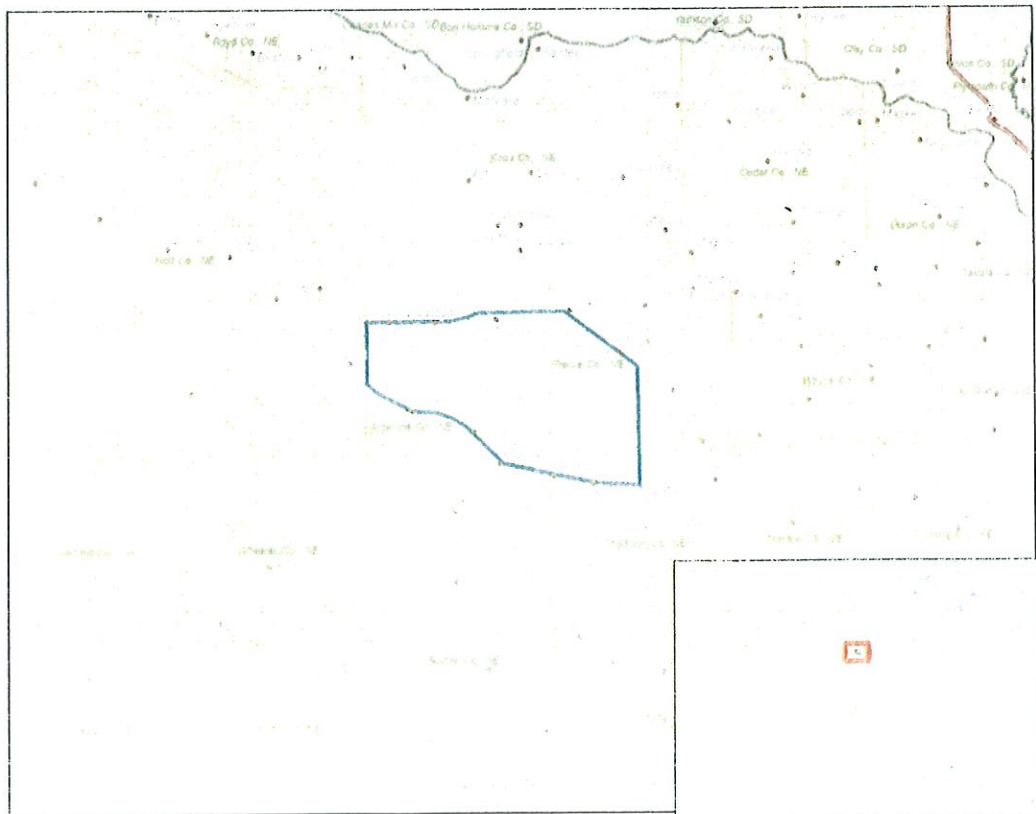


Figure 1: Area of Interest

### 3. Fresnel Zone Analysis

#### Methodology

Our obstruction analysis was performed using Comsearch's proprietary microwave database, which contains all non-government licensed, proposed and applied paths from 0.9 - 23 GHz<sup>1</sup>. First, we determined all microwave paths that intersect the area of interest<sup>2</sup> and listed them in Table 1. These paths and the area of interest that encompasses the planned turbine locations are shown in Figure 2.

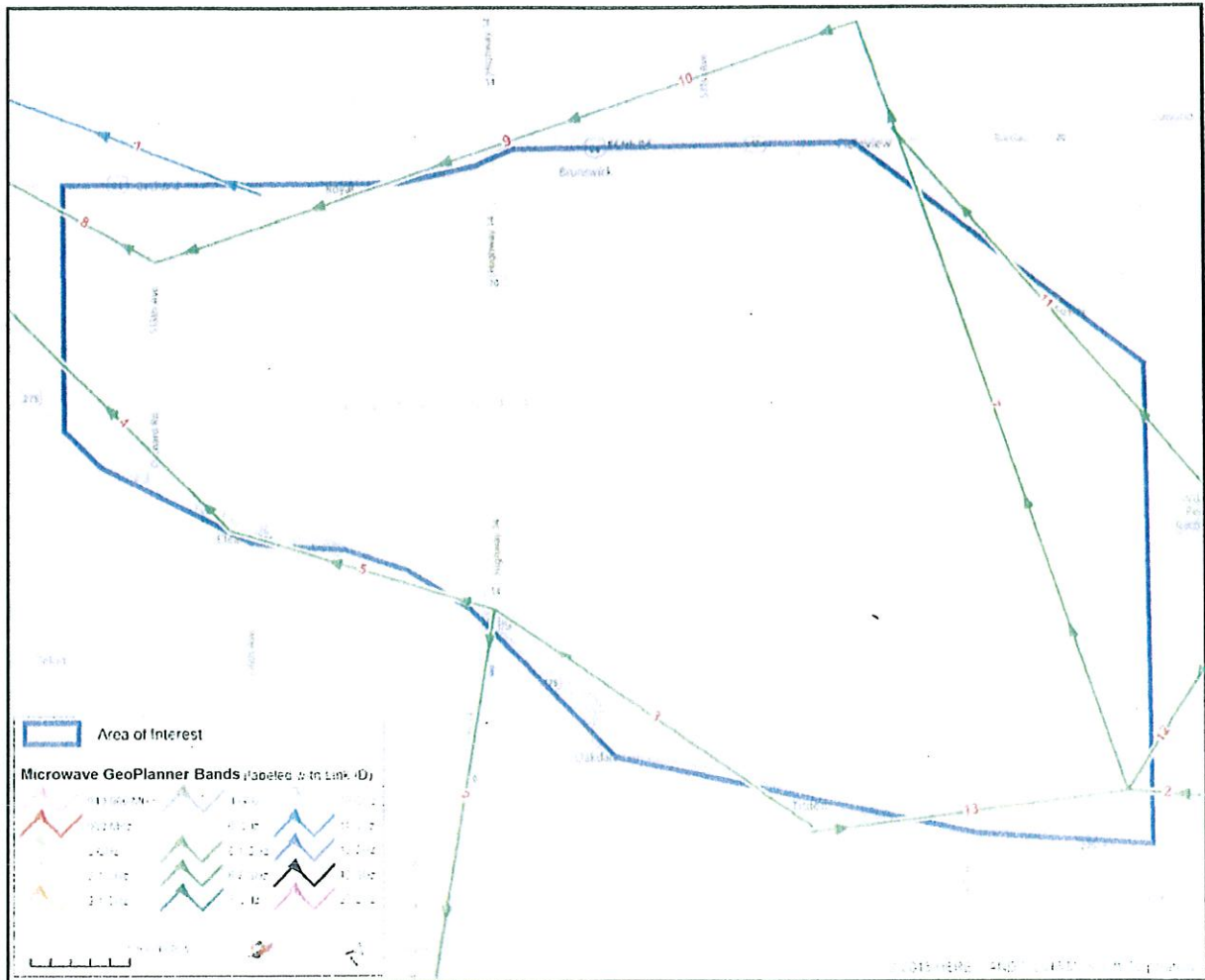


Figure 2: Microwave Paths that Intersect the Area of Interest

<sup>1</sup> Please note that this analysis does not include unlicensed microwave paths or federal government paths that are not registered with the FCC.

<sup>2</sup> We use FCC-licensed coordinates to determine which paths intersect the area of interest. It is possible that as-built coordinates may differ slightly from those on the FCC license.

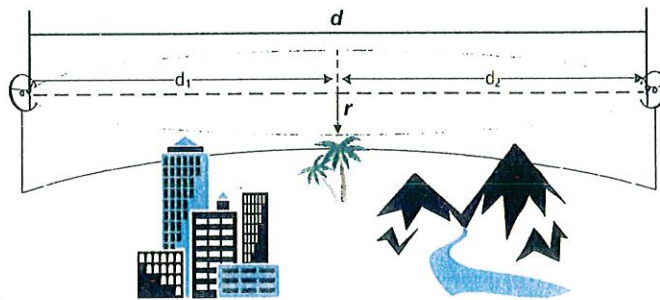


ID	Status	Callsign 1	Callsign 2	Band	Path Length (km)	Licensee
1	Proposed	ROYALHUB	PAGE	11 GHz	21.34	United Farmers Cooperative
2	Licensed	WLS717	WQHL901	Lower 6 GHz	25.61	USCOC Nebraska/Kansas, LLC
3	Licensed	WQFW791	WQFW794	Lower 6 GHz	19.94	NE Colorado Cellular, Inc.
4	Licensed	WQFW792	WQFW793	Lower 6 GHz	22.69	NE Colorado Cellular, Inc.
5	Licensed	WQFW794	WQFW792	Lower 6 GHz	14.38	NE Colorado Cellular, Inc.
6	Licensed	WQFW794	WQUJ209	Lower 6 GHz	21.12	NE Colorado Cellular, Inc.
7	Licensed	WQHL901	WQHL905	Lower 6 GHz	41.77	USCOC Nebraska/Kansas, LLC
8	Licensed	WQHL902	WQHL903	Upper 6 GHz	35.75	USCOC Nebraska/Kansas, LLC
9	Licensed	WQHL905	WQHL902	Lower 6 GHz	38.58	USCOC Nebraska/Kansas, LLC
10	Licensed	WQHL905	WQHL902	Upper 6 GHz	38.58	USCOC Nebraska/Kansas, LLC
11	Licensed	WQJG544	WQJG545	Lower 6 GHz	28.39	NE Colorado Cellular, Inc.
12	Licensed	WQKA254	WQHL901	Lower 6 GHz	15.77	USCOC Nebraska/Kansas, LLC
13	Licensed	WQSY524	WQHL901	Lower 6 GHz	16.72	USCOC Nebraska/Kansas, LLC

Table 1: Summary of Microwave Paths that Intersect the Area of Interest  
(See enclosed mw\_geopl.xlsx for more information and  
GP\_dict\_matrix\_description.xls for detailed field descriptions)

Next, we calculated a Fresnel Zone for each path based on the following formula:

$$r \cong 17.3 \sqrt{\frac{n}{F_{\text{GHz}}} \left( \frac{d_1 d_2}{d_1 + d_2} \right)}$$



Where,

- r = Fresnel Zone radius at a specific point in the microwave path, meters
- n = Fresnel Zone number, 1
- $F_{\text{GHz}}$  = Frequency of microwave system, GHz
- $d_1$  = Distance from antenna 1 to a specific point in the microwave path, kilometers
- $d_2$  = Distance from antenna 2 to a specific point in the microwave path, kilometers

The calculated Fresnel Zone shows the narrow area of signal swath and is calculated for each microwave path in the project area. In general, this is the area where the planned wind turbines should be avoided, if possible. A depiction of the individual Fresnel Zones is shown in Figure 3, and is also included in the shapefiles<sup>3,4</sup>.

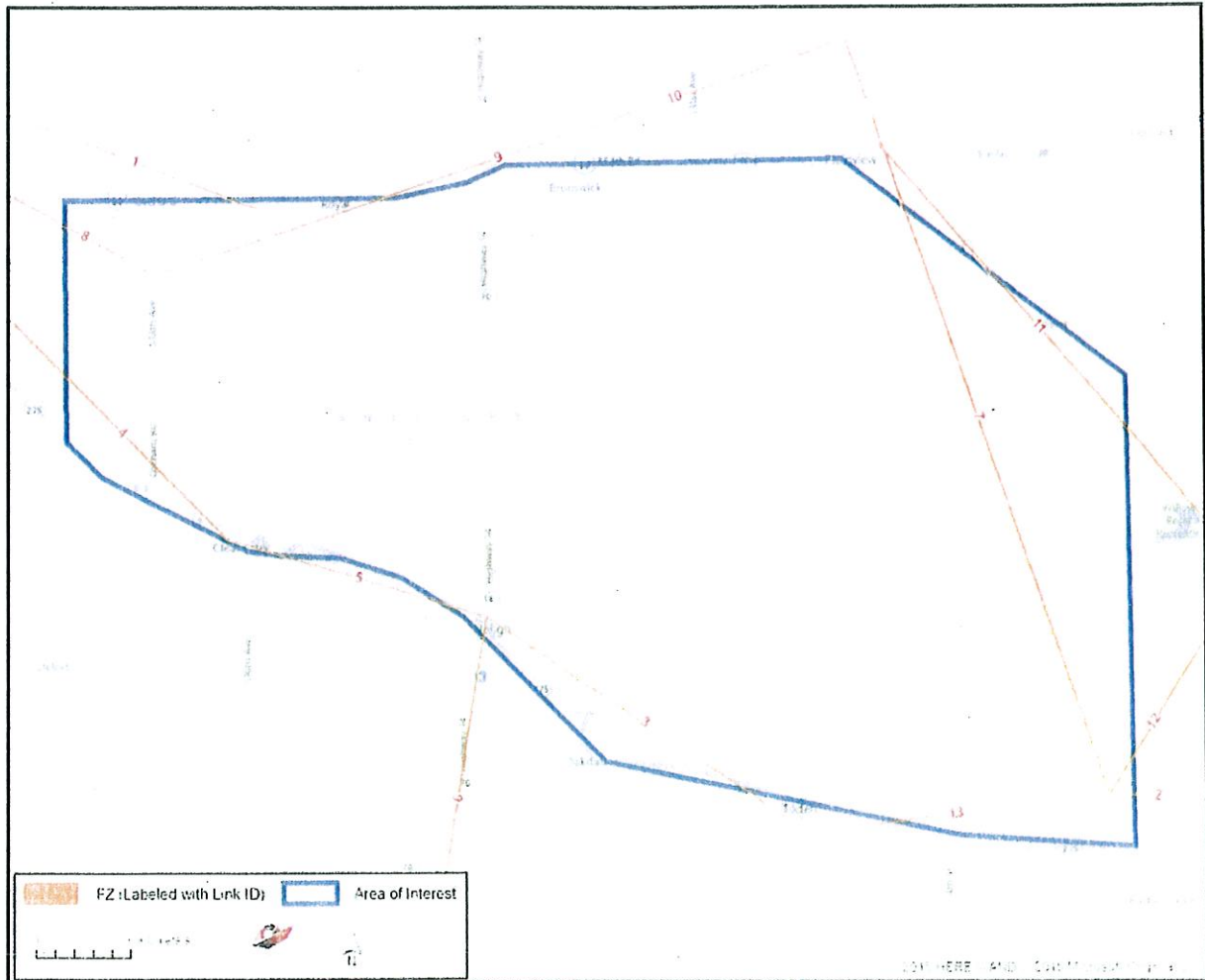


Figure 3: Fresnel Zones in the Area of Interest

<sup>3</sup> The ESRI® shapefiles enclosed are in NAD 83 UTM Zone 14 projected coordinate system.

<sup>4</sup> Comsearch makes no warranty as to the accuracy of the data included in this report beyond the date of the report. The data provided in this report is governed by Comsearch's data license notification and agreement located at [http://www.comsearch.com/files/data\\_license.pdf](http://www.comsearch.com/files/data_license.pdf).





## Discussion of Potential Obstructions

Total Microwave Paths	Paths with Affected Fresnel Zones	Total Turbines	Turbines intersecting Fresnel Zones
13	N/A	N/A	N/A

For this project, turbine locations were not provided; thus we could not determine if any potential obstructions exist between the planned wind turbines and the incumbent microwave paths. If the latitude and longitude values for turbine locations are provided, Comsearch can identify where a potential conflict might exist.

## 4. Conclusion

Our study identified 13 microwave paths intersecting the Upstream Wind Farm project area. The Fresnel Zones for these microwave paths were calculated and mapped. We recommend that all turbines be sited in locations that will not obstruct the Fresnel Zones.

## 5. Contact

For questions or information regarding the Microwave Study, please contact:

Contact person: Denise Finney  
Title: Account Manager  
Company: Comsearch  
Address: 19700 Janelia Farm Blvd., Ashburn, VA 20147  
Telephone: 703-726-5650  
Fax: 703-726-5595  
Email: dfinney@comsearch.com  
Web site: www.comsearch.com